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Hazlett,
Donald L.

A 1997 Search for *Spiranthes diluvialis*

in Southeastern Wyoming and Western Nebraska

Donald L. Hazlett

Sprager Creek, Laramie County, Wyoming

Prepared for:

Bureau of Land Management
Attention: Jeff Carroll, Botanist
Wyoming State Office
5353 Yellowstone Road
Cheyenne, Wyoming 82009

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INTRODUCTION

Spiranthes diluvialis Shev. (Orchidaceae), the Ute ladies tresses orchid, is a rare plant that is listed by the United States Fish and Wildlife Service as a threatened plant species. The Wyoming Natural Heritage Program lists this orchid as G2/S1 (Wyoming Rare Plant Field Guide, 1994). The "G" is a global ranking based on the range-wide status of this species. The most threatened global ranking is G1. A G2 rank indicates that this taxon is imperiled globally because of rarity (6-20 occurrences) or because of factors that make it vulnerable to extinction throughout its range. The "S" is a state rank. The S1 indicates a critically imperiled plant in Wyoming because of extreme rarity (5 or fewer occurrences) or because of a biology or habitat that makes it vulnerable to extinction. Indeed, the impact on riparian areas increases the vulnerability of riparian endemics such as the Ute ladies tresses orchid.

This report lists 26 locations in 6 Wyoming and Nebraska counties that were searched for this orchid during 1997. These searches discovered one new population of *Spiranthes diluvialis*. This discovery was on private land in Laramie County: the first report of this orchid from this county. This new discovery increased the number of known occurrences of *Spiranthes diluvialis* in Wyoming to four locations in four counties: Converse, Goshen, Niobrara and Laramie. Two of these four populations were discovered because of funding for survey work provided to the author by the BLM State Office in Cheyenne, Wyoming. A further product of the BLM funding program for floristic surveys was the discovery of the first, and perhaps the largest, population of this threatened orchid along the Niobrara river in western Nebraska (Hazlett, 1996).

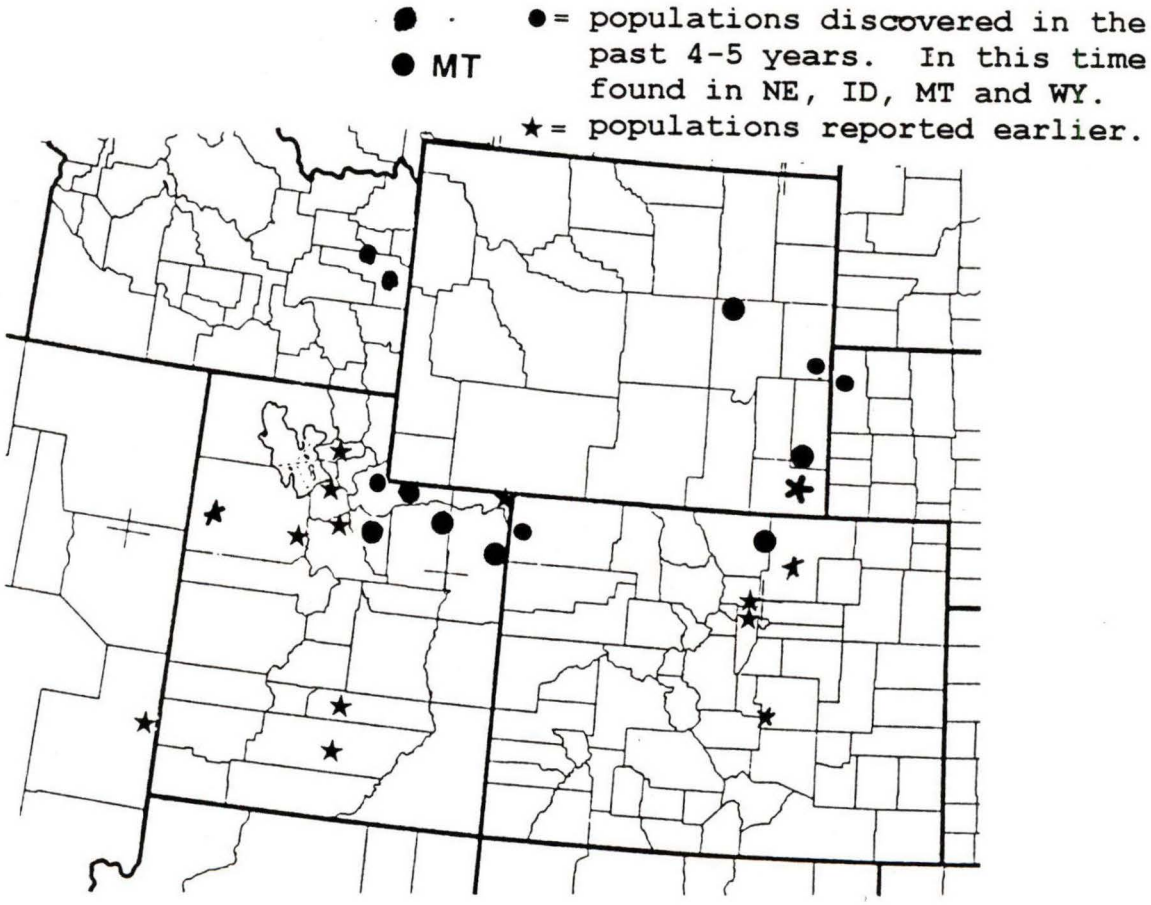
METHODS

The first step in this search was to learn of all known locations of this orchid. This was done by visiting the Rocky Mountain Herbarium, Laramie, Wyoming. The curator of this herbarium, Dr. Ron Hartman, maintains an updated map of known locations of this orchid throughout its range (Figure 1). The next step was to secure all available maps of areas in eastern Wyoming and western Nebraska that had previously been searched for *Spiranthes diluvialis*. This included maps of areas searched by the author (1995-1996) as well as by personnel from the Rocky

Mountain Herbarium (1992-1995). From these maps (provided by the BLM State Office) it was possible to identify riparian areas that had not been searched at all and riparian areas that had been searched only in a few, widely spaced sections.

Field Dates

Eight 10-12 hour days were spent in the field searching for *Spiranthes diluvialis*. These were August 12-14, August 19-20, September 4-5 and September 16. A conservative estimate of 80 field hours were spent during this search in 1997.



Spiranthes diluvialis -- Ute ladies'-tresses

Figure 1. Known locations of *Spiranthes diluvialis* across the entire range of the species (adapted from a map from Ron Hartman). The newly discovered population in Laramie County, Wyoming is indicated by an asterisk.

All known populations of *Spiranthes diluvialis* occur near perennial, often meandering creeks that are inundated during large precipitation events. Even though the habitat for this orchid is known, the spotty occurrence of this orchid over seven states creates a very large search area (Figure 1). Since a 1996 discovery in Nebraska was at the easternmost edge of the range for this species, the initial 1997 search area was to further explore sections of the Niobrara River and its tributaries.

After additional sections of the Niobrara river were searched, from the Wyoming/Nebraska line to Manville, Wyoming, the search area was expanded to include tributaries and creeks further north and south. The next approach was to search as many new areas as possible in Platte, eastern Goshen and eastern Laramie counties.

The search process was to first survey by vehicle the riparian areas identified from maps as potential habitat areas for *Spiranthes*. The initial survey for target areas yielded many dry or sandy creek beds, areas that were not appropriate habitat for this orchid. Another category of less appropriate riparian habitat were intermittent wet spots, especially areas with patches of *Eleocharis sp.* Several alkaline and wet spots were unsuccessfully searched. Nearly 1,000 miles were driven in search "appropriate riparian areas", since perennial streams or target search areas can not easily be determined from topographic maps.

Based on known locations, the perennial streams considered to be most likely *Spiranthes* habitat areas were those with cattails or with meandering stream channels. These habitats were designated as search areas. After a target riparian area was located, the next task was to obtain permission from the owner to search the area. Unless it was state of BLM land, the process of obtaining permission sometimes took a long time.

Permission to search private land was pursued by stopping by the nearest house (often many miles from the target search area) to inquire if a particular riparian area could be searched. Oftentimes there was no one home(the dogs were always home). If no one were home, another house was visited. Whenever someone was at home the reception was usually a warm one and on several occasions the occupants requested and did accompany me during the search of their property. One of the best ways to obtain permission was to visit houses late in the afternoon or in early evening when the ranchers and farmers were home. In this fashion permission can be obtained to search target areas the following morning.

Telephone calls to property owners was a poor means to obtain permission. This was tried and had poor results. Land owners were more likely to grant permission if asked in person than if asked over the telephone.

RESULTS

Field surveys were made of 26 riparian areas. The unproductive searches were in four Wyoming and two Nebraska counties (Appendix I). The date and location of each area in Wyoming that was searched is highlighted in blue on the four BLM edition topographic maps included with this report. These maps are: *Cheyenne, Chugwater, Lusk and Torrington.* Future searches for *Spiranthes* in Wyoming should refer the these maps. These maps are kept in the BLM State Office in Cheyenne, Wyoming.

Location and Habitat of *Spiranthes* in Laramie County

On September 4, 1997 a population of *Spiranthes diluvialis* was located along Sprager Creek at R.64 W / T.17 N section 10 (NW quadrant). All individuals of *Spiranthes* were in the unmown border area, within 6 m of the cattail-filled creek. Please refer to the habitat photograph of Sprager Creek on the cover page. Note the old brown grass (*Bromus inermis*) stems in the unmown section near the creek. *Spiranthes* individuals were located only in this and in other unmown areas, always near the creek. On this date a total of 63 individuals were counted on the west side of Sprager Creek. Less distance along the eastern side of Sprager Creek had been mowed. Along the eastern edge of the Creek only 8 Spiranthes orchids were located. Of 71 individual plants that were seen, all but three of these were in fruit. One of the three flowering individuals was photographed (Figure 2).

Ownership

The private land in Laramie County with this population of Ute Ladies tresses orchid is owned by David Hansen. His address is: David Hansen, 3395 Road 140, Meriden, Wyoming 82081. David is very aware and interested in the native plants that occur on his property. He knew of the possibility that *Spiranthes* was in this region before I asked permission to search his property.

The upstream and downstream areas of Sprager Creek, adjacent to the section where *Spiranthes diluvialis* was discovered, are owned by Jon and Diana Kirkbride, 3206 Road 139, Meriden, Wyoming, 82108. The upstream land owned by the Kirkbrides was

also searched on September 4, but the orchid was not discovered. However, on this date most individuals of this orchid were in fruit, a time when orchid plants are not easily located. Since the habitat on the Kirkbride property is very similar to that on the Hansen property, it is possible that a search of this upstream area in late July or early August would discover other individuals of this orchid. I showed both David Hansen and Jon Kirkbride the newly discovered orchid along Sprager Creek. They were both very interested in this orchid and were concerned about its protection.

The downstream portion of Sprager Creek on the Kirkbride property, north of the residence, is grazed and is channeled. This area was also searched, but it is less likely that further searching in this area would locate individuals of this orchid. However, another mown tract of land owned by David Hansen that is near the Hansen residence has a meandering section of Sprager Creek that is appropriate habitat for *Spiranthes*. Although this section of Sprager Creek was searched unsuccessfully on August 24, 1995, it would be worthwhile to again search this section of Sprager Creek.

Figure 2. A flowering individual of Spiranthes *diluvialis* along Sprager Creek (photographed September 4, 1997). Only three of 71 individuals counted on this date were in flower.

Spiranthes Associates

Plant species that occurred in the vicinity of Sprager Creek, Laramie County, in *Spiranthes diluvialis* habitat were collected and identified (Table 1). Plant identifications were verified at the Rocky Mountain Herbarium, University of Wyoming, Laramie, WY. This is not an exhaustive plant species list for this riparian areas, since many of the plant species were past flowering stage in early September.

Table 1. Plant species that occur along Sprager Creek, Laramie County Wyoming in the same riparian habitat as *Spiranthes diluvialis*.

Asteraceae
Ambrosia trifida L. [#10165]
Aster ericoides L. var. pansus (Blake) Bovin [#10156]
Aster lanceolatus Willd. ssp. hesperius
(Gray) Semple & Chm. [#10171]
Bidens frondosa L. [#10162]
Erigeron lonchophyllus Hook. [#10167]

Convolvulaceae
Cuscuta indecora Choisy var. *neuropetala*
(Engelm.) Hitchc. [#10147] (parasite on *Lycopus asper)*.

Cyperaceae
Scirpus validus Vahl. [#10149]

Equisetaceae
Equisetum laevigatum A. Br. [#10157]

Fabaceae
Medicago lupulina L. [#10164]
Melilotus albus Medic.

Iridaceae
Sisyrinchium angustifolium Mill. [#10160]

Juncaceae
Juncus balticus Willd. [#10152]
Juncus longistylis Torrey [#10155
Juncus nodosus L. [#10154]

Juncaginaceae
Triglochin maritimum L. [#10153]

- Table 1 continued -

Lamiaceae
Lycopus americanus Muhl. Ex Barton [#10161]
Lycopus asper Greene [#10151]

Onagraceae
Epilobium palustre L. var. *gracile* (Farw.) Dorn [#10166]

Orchidaceae
Platanthera dilatata (Pursh) Lindl. ex Beck. [#10148]
Spiranthes diluvialis Shev. [#10158]

Plantaginaceae
Plantago major L. [#10174]

Poaceae
Bromus inermis Leyss. [#10163]
Calamagrostis inexpansa A. Gray [#10170]
Phleum pratense L. [#10173]

Saxifragaceae
Parnassia palustris L. var. *montanensis*
(Fern & Rydb.) C. L. Hitchc. [#10169]

Scrophulariaceae
Pedicularis crenulata Benth. [#10159]

Typhaceae
Typha latifolia L. [#10150]

Significant Plants at Spiranthes Survey Areas

Noteworthy plant species were collected at several locations that were searched, but where *Spiranthes diluvialis* did not occur. These included the following:

1) Gaura neomexicana Wooton var. *coloradensis* (Rydb.) Munz.
The Colorado butterfly plant was seen at 6 locations in Laramie County. Five of these locations are indicated(as GANE)on the enclosed BLM edition topographic Cheyenne map and one is indicated on the Chugwater map. These locations are known to Wyoming botanists and are marked in Fertig (1994).

2) *Utricularia macrohiza* LeConte (Lentibulariaceae)
This bladderpod was seen in flower on August 13 along the Niobrara River, just west of Van Tassel.

In addition, other interesting plant species were collected. Among the more interesting taxa from these additional collections were *Triglochin palustris* L. from Duck Creek [#10010], *Carex hystricina* Muhl. ex Willd. [#9990] and *Erigeron lonchophyllus* Hook.[#9991] from the Niobrara River and *Potamogeton richardsonii* (Bennett) Rydb. from a stock pond in northeastern Niobrara County. A voucher of *Spiranthes diluvialis*, the 26 listed associates (Table 1) and 20 plant specimens collected from other surveyed areas in eastern Wyoming will be archived in the Rocky Mountain Herbarium.

DISCUSSION

The Impact of Mowing on *Spiranthes diluvialis*

Each of the three populations of *S. diluvialis* that I have discovered in Wyoming and Nebraska during the past two years has been in or near areas that are mown for grass hay. On the other hand, I have also surveyed many mown areas near streams that did not have this orchid. Meanwhile, this orchid can also occur along streams that have no grazing or mowing. Nonetheless, the meandering, level area along perennial streams that are often utilized areas by ranchers as cattle pastures and/or as fields to mow for grass hay is one of the prime, potential habitats of the Ute ladies tresses orchid.

An unanswered management question is the long-term impact of grazing or mowing on populations of *Spiranthes diluvialis*. In 1996 the thousands of *Spiranthes* individuals located on August 24 along the Niobrara River in Nebraska occurred mainly in areas that had been mown in mid-July. This observation suggested that mowing had little impact on *Spiranthes*. In fact, it was possible that the removal of grass canopy actually favored the growth of the late-bolting *Spiranthes diluvialis*.

In 1997, however, the rainfall patterns did not allow for the normal July mowing schedule. The 1997 survey for *Spiranthes diluvialis* by personnel in Nebraska (John Sidle, personal communication) still located hundreds of individual orchids, but few of these were in the mown areas. It appeared that August mowing in 1997 had cut off inflorescences and decreased the number of flowering plants. In addition, all individuals in the

newly located population of *Spiranthes diluvialis* along Sprager Creek also occurred in the area that had not been mown. Again, the 1997 mowing was delayed because of the late summer rains. It is possible that individual perennial orchid plants can survive mowing for one or several years. On the other hand, it is also reasonable to suspect that repeated, late summer mowing or grazing will eventually cause mortality of individuals. In addition, seed production and the establishment of new individuals declines whenever inflorescenece are mown or grazed. The long-term impact of grazing or mowing on *Spiranthes diluvialis* can best investigated by long-term monitoring of selected populations.

How Threatened is *Spiranthes diluvialis*?

Prior to 1994 there were about 10 known locations for *Spiranthes diluvialis* throughout its range. With the current population included, there are 25-30 known populations of this orchid in seven states. At what point are there enough populations discovered to "downrank" the protected status of this species? For *Spiranthes diluvialis* the next lowest, less threatened global rank category would be G3. The G3 rank is for a taxon with 21-100 locations. On the other hand, the imperiled status of a taxon's biology can justify leaving a species at a higher rank of protection even when a fairly large number of populations are known. For *Spiranthes diluvialis* it appears that the degradation of many riparian areas is reason enough to leave this species at its current global protection rank of G2.

Spackman *et al.* (1997) ranked this orchid in Colorado as G2/S2, compared to a more threatened G2/S1 ranking in Wyoming. The "G" or global ranking is the same, but Colorado considers the "S" or state rank for this orchid to be "imperiled in the state" due to rarity, rather than the S1 or "critically imperiled" status assigned in Wyoming. In contrast to Wyoming, the more secure land ownership of *Spiranthes diluvialis* populations in Colorado may have entered into the decision to assign a slightly less threatened state rank for this taxon.

Future Work

There were several new populations of *Spiranthes diluvialis* discovered in 1996. So far, the population in Laramie County, Wyoming is the only new population reported for 1997. Future work should focus on additional surveys as well as the possibility of checking field locations (from herbarium

specimens) of plants that are often associated with this orchid. It is possible that associated species were collected before this orchid was in flower. If this were the case, a survey later in the year of areas where associated plant species were collected is a possible means to locate new populations of *Spiranthes diluvialis*.

References

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Appendix I. Areas searched during 1997 where *Spiranthes diluvialis* plants were not encountered. Areas listed by counties.

A. Niobrara County, Wyomng: areas searched on August 12, 13, 14, 19 & 20, 1997.

1. T32N / R60W / sections 33-34. Along the Niobrara River east of Lusk.
   - Private land
   - Searched with permission 8/12
2. T31N / R60W / sections 4,9,15 & 18. Along the Niobrara River east of Lusk.
   - Private land
   - Searched with permission 8/12
3. T31N / R61W / sections 4-5, 11-12 & 13. Along the Niobrara River east of Lusk.
   - Private land
   - Searched with permission 8/13
4. T32N / R63W / sections 9 & 15-16. Along the Niobrara River west of Lusk.
   - Private land
   - Searched with permission 8/20
5. T32N / R64W / sections 4-6 & 9-10. Along the Niobrara River west of Lusk.
   - Private land
   - Searched with permission 8/20
6. T32N / R65W / section 1. Along the Niobrara River just NE of Manville.
   - Private land
   - Searched with permission 8/20
7. T32N / R61W / section 30. Along Duck Creek west of Lusk.
   - Private land
   - Searched with permission 8/13
8. T34N / R61W / section 36 (state land) and 24 (private land). Along Fitzsimmons and S. Bar Creek. Just North of Hat Creek Ridge. 8/13
9. T 34N / R60W / section 16 (state land) and 14 (private land).
   S. Bar Creek and a check dam pond. 8/13

B. Sioux County, Nebraska: August 13, 1997.

1. T34N / R 57W / section 14-15 & 24. Along Antelope Creek.
   - Private land
   - Searched with permission.

C. Platte County, Wyoming: August 19, 1997
   1. T21N / R66W / sections 20-21 & 29 (state land). Along Chugwater River.
   2. T23N / R68W / section 36 (state land). Along N. fork of Antelope Creek.
   3. T23N / R67W / section 31 (state land). Along N. fork of Antelope Creek.

D. Goshen County, Wyoming: September 4, 1997
   1. T23N / R61W / sections 27, 32 & 34. Along Horse Creek and East Springer Creek.
      - Private land
      - Searched with permission
   2. T19N / R61W / sections 3, 5-4
      - Private land
      - Searched with permission

E. Scots Bluff County, Nebraska: September 5, 1997.
   1. T23N / R58W / section 34.
      - Private land
      - Searched with permission
   2. T22N / R58W / sections 11, 21-22 & 27-28. Along Dry Creek Drain & Kiowa Creek
      - Private land
      - Searched with permission

F. Laramie County, Wyoming: September 4, 5, & 16.
   1. T18N / R63W / sections 8-9. Along Horse Creek.
      - Private land - Searched with permission
   2. T22N / R62W / section 24. Along Horse Creek.
      - Private land - Searched with permission
   3. T15N / R63W / sections 29-30. Along Lodgepole Creek.
      - Private land - Searched with permission
   4. T15N / R63W / section 3. Along Lodgepole Creek.
      - Private land - Searched with permission
   5. T14N / R62W / sections 31-33. Along Muddy Creek.
      - Private land - Searched with permission
   6. T13N / R61W / sections 23-24 & 36. Along Spring Creek.
      T13N / R60W/ section 18. Along Spring Creek.
      - Private land - Searched with permission
   7. T12N / R62W / section 18. Along Crow Creek.
      T13N / R63W / section 16. Along Crow Creek.
      T13N / R64W / sections 5, 8 & 9.
      - Private land - Searched with permission
   8. T13N / R65W / sections 34-35
      - Private land - Searched with permission